

Notice of Allowability

Application No.

09/996,527

Examiner

James P. Hughes

Applicant(s)

NAKASUJI, MAMORU

Art Unit

2883

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to The correspondence received on July 26, 2004.
2. ☒ The allowed claim(s) is/are 1-13, 15, and 16.
3. ☒ The drawings filed on 8-23-04 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, page 2 of the correspondence filed July 26, 2004 and page 2 of the amendment filed on April 21, 2004, have been fully considered and are persuasive. The English translation of the December 4, 2000 priority document has been received. This priority date is before the U.S. filing date of Suzuki '852, which has a common assignee (Nikon Corporation), and is a 35 USC 102(e) reference. The rejections under 35 USC 103 have been withdrawn.

Allowable Subject Matter

2. Claims 1-13, 15, and 16 are allowed. Claims 1 and 13 are allowed because the prior art of record fails to teach or fairly suggest a charged particle beam (CPB) microlithography system, or means for, comprising, in combination with the other recited limitations in the claims, a magnetic-field-compensation circuit connected to the magnetic-field-compensation coil and configured to deliver an electrical current to the magnetic-field-compensation coil. Claims 2-10 are allowed by virtue of their dependence on claim 1.

Claim 11 is allowed because the prior art of record fails to teach, or fairly suggest, a method or means for a charged-particle beam (CPB) microlithography method in which an illumination beam is directed by a CPB illumination-optical system, comprising: in combination with the other recited limitations in the claim, detecting a magnetic field external to the CPB illumination-optical and projection-optical system; placing a magnetic-field-compensation coil

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between the CPB illumination-optical system and CPB projection-optical system or between the CPB projection-optical system and the substrate; and based on the detected external magnetic field, supplying electric current to the magnetic-field compensation coil to produce a corresponding magnetic field that cancels at least a portion of the detected external magnetic field. Claim 12 is allowed by virtue of its dependence on claim 11.

Claim 13 is allowed because the prior art of record fails to teach or fairly suggest an apparatus, or means for, a charged-particle-beam (CPB) optical system, comprising, in combination with the other recited limitations in the claim, a magnetic-field-compensation coil situates between the illumination-optical system and the projection-optical system or between the projection-optical system and the substrate, and a magnetic-field-compensation circuit connected to the magnetic-field-compensation coil and configured to deliver an electrical current to the magnetic-field-compensation coil to produce a corresponding magnetic field that cancels at least a portion of the external magnetic field detected by the magnetic field sensor.

Claims 15 and 16 are allowed because the prior art of record fails to teach, or fairly suggest a method, or means for, a charged-particle beam (CPB) microlithography process – or a process for manufacturing a microelectronic device – comprising: in combination with the other recited limitations in the claims, detecting a magnetic field external to the illumination-optical system and projection-optical system; in response to the detected external magnetic field, producing a corresponding magnetic field locally in the vicinity of the optical axis either between the illumination-optical system and the projection-optical system or between the projection-optical system and the substrate so as to cancel at least a portion of the detected external magnetic field.

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Conclusion


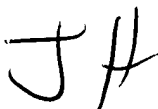
3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Goto et al. (6,707,301) teaches an external magnetic field measuring and correcting apparatus for an MRI system. (Abstract) Carlini et al. (2003/0214296) teaches a device and method for compensating for magnetic noise fields in MRI machines. (Abstract)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James P. Hughes whose telephone number is 571-272-2474. The examiner can normally be reached on Monday - Friday 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James Hughes
Patent Examiner
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Frank G. Font
Supervisory Patent Examiner
Technology Center 2800